CLAIMS

1. Irradiation cell for producing a radioisotope of interest through the irradiation of a target material by a particle beam, comprising a metallic insert (2) forming a cavity (7) designed to house the target material and to be closed by an irradiation window, characterised in that said metallic insert (2) comprises at least two separate metallic parts (8,9) of different materials, being composed of at least a first part (8) comprising said cavity (7) and a second part (9).

2. Irradiation cell according to claim 1, wherein said second part (9) surrounds said cavity (7), in a manner to form a channel for guiding a cooling medium.

3. Irradiation cell according to claim 2, wherein said cell further comprises a supply means (6) for a cooling medium and in connection with said supply means, an element (3), called 'diffusor', surrounding said cavity (7), said diffusor (3) being arranged for guiding said cooling medium around said cavity, and wherein said second part (9) surrounds both said cavity and said diffusor, in a manner to form a return path for said cooling medium between said diffusor and said second part.

4. Irradiation cell according to any one of claims 1 to 3, wherein the contact between said first and second part (8,9) is a metal-to-metal contact, and wherein the sealing between said parts (8,9) is obtained by at least one O-ring (33).

5. Irradiation cell according to any one of claims 1 to 3, wherein the sealing between said first and second part (8,9) is obtained by a gold foil present between said parts.

6. Irradiation cell according to any one of claims 1 to 5, wherein said insert (2) is composed of two metallic parts (8, 9).

7. Irradiation cell according to any one of claims 1 to 6, wherein said parts (8,9) are assembled together by a number of bolts (10).

8. Irradiation cell according to any one of claims 1 to 6, wherein said parts (8,9) are assembled together by welding.

9. Irradiation cell according to any one of claims 1 to 8, wherein said first part (8) comprises a flat, circular and ring-shaped portion (16) having an inner circular edge (50) and an outer circular edge (51), a cylindrical portion (17) rising perpendicularly from the inner circular edge of said flat portion, and a hemispherical portion (18) being on top of said cylindrical portion, the cavity (7) being formed inside said cylindrical (17) and hemispherical (18) portions.

10. Irradiation cell according to claim 9, wherein said cylindrical portion (17) and/or said hemispherical portion (18) have a wall thickness comprised between 0.3 and 0.7 mm and/or said cavity has a length of at least 50mm.

11. Irradiation cell according to claim 9 or 10, wherein said second part (9) has the form of a hollow cylinder having two flat sides (52,53) essentially perpendicular to a cylindrical side (54), said cylinder being connected by one flat side (53) against the flat portion (16) of said first part (8).

12. Irradiation cell according to any one of claims 9 to 11, wherein one of said two parts (8,9) has a ridge (26) and the other has a groove (27) corresponding to said ridge, in order to obtain perfect coaxial positioning of said two parts with respect to each other.

13. Irradiation cell according to any one of the preceding claims, wherein said first part (8) is made of niobium or tantalum.

14. Irradiation cell according to claim 6, wherein said second part (9) is made of stainless steel.

15. An insert (2) for use in an irradiation cell, according to any one of the preceding claims.

16. Method for producing an insert (2) according to claim 14, comprising the steps of

- forming a first part (8) through machining
- forming a second part (9)
- assembling said first (8) and second part (9) with bolts (10) or through welding.

17. Use of an irradiation cell according to any of claims 1 to 13, for filling the cavity (7) volume with about 50% of target material, before starting irradiation.